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ORIGINAL ARTICLE

ORAL SURGERY

Survey of throat pack use: An oral surgery perspective

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Abstract

Aim: Previous national surveys highlighted variation in throat pack use, lack of team-approach and poor adherence to safety processes. A recent review found no evidence supporting anaesthetist-inserted throat packs. A survey of oral surgeons was undertaken to establish current practice.

Materials and methods: Anonymous online questionnaire publicised via BAOS.

Results: Fewer oral surgeons are placing throat packs routinely. There is a trend towards surgeons placing throat packs rather than anaesthetists. Four-fifths of surgeons are following best safety processes: radio-opaque material, throat pack from swab count, WHO 'sign out' check for removal. The increase in surgeons' view that they have responsibility for throat pack removal is consistent with more surgeons placing throat packs. Increase in surgeons' awareness of throat pack incidents. A quarter of surgeons cognisant of recent recommendations.

Conclusions: Continued variation found in oral surgeons' use of throat packs. The decrease in routine throat pack use suggests increased decision-making by surgeons. A change in practice from anaesthetists to surgeons inserting throat packs noted. It appears this change is driven by anaesthetists, given the lack of knowledge of recent recommendations by oral surgeons. A striking improvement in adherence to safety processes observed. No adoption of team-approach to throat pack use. It is vital now to establish an evidence-base for throat pack use during oral surgical procedures.

KEYWORDS
oral surgery, patient safety, throat pack

CLINICAL RELEVANCE

Scientific rationale for study

Recently published recommendations highlighted a lack of evidence for routine insertion of throat packs by anaesthetists. Our survey explores if these recommendations have impacted oral surgeons' practice.

Principal findings

Variation in throat pack use amongst oral surgeons, however a decrease noted in routine use. A change in practice from anaesthetist-led to surgeon-led insertion of throat packs observed. Significant improvement in safe use.

Practical implications – suggestions for clinical practice

Indications for oral surgeons' use of throat packs may include: anticipated blood loss, risk of debris and laser surgery. Justification required for throat pack use. Theatre safety culture is critical.

INTRODUCTION

The UK National Patient Safety Agency (NPSA) released a 2009 alert to reduce the risk of throat pack retention after surgery.[1] They recommended local revision of policies and procedures to ensure: justification for throat pack use for each patient; at least one visual and one documentary check are used whenever they are placed; that all staff are fully informed. The NPSA also proposed local adaptation of the World Health Organisation (WHO) surgical safety checklist to include throat packs.

In 2011, retention of a swab, including throat packs, was added to the 'Never Event' (NE) list under the sub-theme of retention of foreign objects post-procedure. Although the nationally reported incidence of throat pack retention is small (see Table 1), there are serious potential repercussions including life-threatening airway obstruction.[2]

Throat packs can be used during any general anaesthetic but most commonly they are placed for ear, nose and throat (ENT) and oral and maxillofacial surgical (OMFS) procedures in the UK. Recognized indications are to prevent ingestion or aspiration of blood and/or debris, airway protection when using lasers and for stabilizing an artificial airway.[3–5] Accepted disadvantages include sore throat from several randomized trials of nasal surgery.[6,7] International variation in use suggests subjective rather than evidence-based practice.[1,6]

Two national surveys a decade ago examined throat pack use by both OMFS surgeons and anaesthetists and showed great variation in practice.[8,9] Both highlighted a lack of team-approach to taking responsibility for throat pack removal, with disagreement between surgeons and anaesthetists over who had ultimate responsibility.[8,9] The 2008 survey also emphasised poor adherence to safety processes.[8]

In 2018, an evidence-based review of anaesthetist-placed throat packs was published with recommendations endorsed by the Difficult Airway Society (DAS), the British Association of Oral and Maxillofacial Surgery (BAOMS) and the British Association of Otorhinolaryngology, Head and Neck Surgery (ENT-UK).[10] This highlighted the lack of evidence supporting throat pack use by anaesthetists and stated that anaesthetists should not routinely insert throat packs. It recommended if a throat pack was indicated, it should be placed by the surgeon and be taken from the swab count. (See Appendix 1 for summary of the recommendations).

Given the recently published review may have affected anaesthetic throat pack use and the most recent national surveys were a decade ago, the need for an understanding of contemporary use of throat packs amongst surgeons was important. A national survey was undertaken to ascertain the current practice of oral surgeons, their concurrence with safety processes, awareness of the 2018 recommendations, views regarding responsibility and any change in practice.

METHODS

An anonymous questionnaire of closed questions was created using an online survey tool; several were questions from the 2008 survey to allow comparison and examine any changes (see Appendix 2).[8] A final open comments section collected additional remarks. The survey was publicised via the British Association of Oral Surgeons (BAOS) website and social media accounts; it was accessible for a three-month period, March to June 2020.

RESULTS

Two hundred eleven responses were received. The first question established current throat pack use (Table 2). A marked decrease in the numbers of surgeons who place throat packs routinely is seen when compared to the Bisase et al survey.[9] The number of surgeons who never use throat packs appears static.

TABLE 1 Reported national incidence of retained throat packs

Year period	Number of retained throat packs	Total number of retained foreign objects post-procedure
2012–2013	2	124
2013–2014	8	134
2014–2015	8	102
2015–2016	7	107
2016–2017	3	114
2017–2018	5	102
2018–2019[a]	2	104
2019–2020[a]	1	90

[a]Provisional publication data.

TABLE 2 Current practice for throat pack use for routine oral surgical procedures

Do you use a throat pack for routine oral surgical procedures?	Current Survey (*n* = 211)	Knepil and Blackburn[8] Survey (*n* = 176) Anaesthetists and Surgeons	Bisase et al[9] Survey* (*n* = 150) *Surgeons' responses only	Bisase et al[9] Survey* (*n* = 120) *Anaesthetists' responses only
Always	46%	39%	70% ('Routine')	63% ('Routine')
Sometimes	37%	52%	n/a	n/a
Never	17%	9%	15%	14%
Do not know	0%	0%	n/a	n/a

TABLE 3 Category of staff placing the throat pack

Who always, or nearly always, places the throat pack?	Current Survey Response % (*n* = 209)	Knepil and Blackburn[8] Survey Response % (*n* = 167) Anaesthetists and Surgeons
Anaesthetist	62	82
Surgeon	29	11
No preference	6	6
Do not know	3	<1

TABLE 4 Throat pack included in the scrub nurse's swab count

Is the throat pack included in the scrub nurse's swab count?	Current Survey Response % (*n* = 209)	Knepil and Blackburn[8] Survey Response % (*n* = 166)
Yes	78	29
No	16	60
Do not know	6	11

The current survey shows a trend towards surgeon-inserted throat packs and a concomitant reduction by anaesthetists, when compared with Knepil and Blackburn's results (Table 3).[8]

39% of participants stated that the type of airway (endotracheal tube [ETT] or laryngeal mask airway [LMA]) used influenced their decision to place a throat pack. The findings with regards to safe throat pack use were consistent: 79% used radio-opaque material, 8% non-radio-opaque and 13% were unsure; 86% used a WHO surgical safety checklist with a check for throat pack use, 8% did not, and 6% were unsure. More accountable throat pack use was seen with the throat pack being part of the swab count, when compared with Knepil and Blackburn's results (Table 4).[8]

The current survey shows an increase in surgeons' view that they have responsibility for throat pack removal compared to previous surveys (Table 5).[8,9] Approximately a third of all staff supported shared responsibility by anaesthetist and surgeon, and this view is unchanged.

38% of surgeons declared knowledge of throat pack incidents; a marked increase from the 22% reported in 2008.[8] Only 26% of respondents were aware of the recommendations published in 2018 by DAS, BAOMS and ENT-UK.[10]

A total of 32 additional comments were made, mostly regarding the importance of culture in the theatre environment when using throat packs, notably: team working, shared decision-making, following robust safety protocols and consistency of processes.

DISCUSSION

This survey, publicised via BAOS, received 211 anonymous responses. Due to the freely accessible, internet-based questionnaire used we cannot establish the response rate. However, the numbers of respondents were greater than previous surveys.[8,9]

Evidence for throat pack use

The over-whelming advice from the 2009 NPSA document to the more recent 2018 recommendations by DAS, BAOMS and ENT-UK is the need to justify throat pack use for each patient.[1,10] So what is the evidence supporting throat pack use? Table 6 summarizes the findings. No throat pack offers one hundred percent protection against leakage of blood into the trachea or stomach.[11] Randomized controlled trials examining post-operative nausea and vomiting following nasal surgery found throat pack use makes no difference.[6,7,12] It seems reasonable to extrapolate this finding to OMF surgery. The authors of an RCT assessing the effect of omitting throat packs for paediatric cleft lip/palate surgery, advocate using throat packs only when significant blood loss is anticipated.[13] This seems a rational approach.

Another throat pack indication is to prevent aspiration of debris. Some respondents in our survey stated they used a throat pack to reduce the risk of loss of a tooth fragment/filling, whilst others stressed that a careful approach with a good assistant negated any need for a throat pack. A small 2019 anaesthetic survey found they were unlikely (8%–18%) to use a throat pack if pharyngeal soiling was anticipated.[14] However, 93% of anaesthetists and surgeons in the 2011 survey thought throat packs gave some benefit in preventing aspiration of blood/debris, so a change in practice is suggested.[9] No evidence exists to support or refute this indication, however, the 2018 review paper suggests degree of blood loss or risk of debris are reasonable surgical indications for throat pack placement.[10]

Throat packs have been used to prevent air leakage around an uncuffed tracheal tube in paediatric practice, however, it is more appropriate to exchange the tube for a larger size or use a cuffed ETT.[15]

The final indication for throat packs is during laser surgery to the oro-pharynx to reduce the risk of ignition of the ETT.[16] The Medicines and Healthcare products Regulatory Agency

TABLE 5 Category of staff responsible for removal of the throat pack

Who is responsible for the removal of the throat pack?	Current Survey (n = 207)	Knepil and Blackburn[8] Survey (n = 169) Anaesthetists and Surgeons	Bisase et al[9] Survey* (n = 150) *Surgeons' responses only	Bisase et al[9] Survey* (n = 120) *Anaesthetists' responses only
Anaesthetist	3%	34%	54%	76%
Surgeon	56%	18%	41%	5%
Whoever places the throat pack	10%	13%	4%	7.5%
Both anaesthetist and surgeon	31%	34%	–	-
Scrub nurses' responsibility	n/a	n/a	1%	6.5%
Theatre team	n/a	n/a	0%	5%

TABLE 6 Indications for throat pack use relevant to oral surgical procedures and summary of the supporting evidence

Throat pack indication	Evidence supporting?	Justification for use
Prevention of nausea and vomiting due to blood entering stomach	No. No difference in incidence of nausea and vomiting whether TP used or not in nasal surgery RCT's.[6,7,12]	Not justified, however, degree/severe blood loss suggested[10,13]
Prevention aspiration of debris	Lacking	Surgeon dependent[10]
Prevention of air leakage around uncuffed ETT in paediatric patients	No. Exchange tube for larger uncuffed ETT or use cuffed ETT[15]	Not justified
During laser surgery to oro-phaynx	Advised by MHRA with uncuffed tracheal tubes[17]	Consider change to cuffed tracheal tube to avoid need for TP

(MHRA) advise the use of wet gauze with uncuffed ETT to minimise the leakage of anaesthetic gases.[17] Two respondents in our survey highlighted their use of throat packs when using lasers and felt this was the only indication for their use.

Morbidity and mortality associated with throat pack use

There are recognized complications of throat pack placement. Disadvantages include a sore throat following randomised controlled trials (RCT) of patients undergoing nasal surgery.[6,7] Only one RCT has examined incidence of post-operative sore throat after surgical removal of wisdom teeth. The authors found no difference in sore throat prevalence with or without throat pack use, however, this study did not use a standardized pain rating and had no power calculation to establish a suitable sample size, so the results should be viewed with caution.[18] Multiple case reports document other complications associated with throat pack use ranging from aphthous lesions,[19] unilateral pharyngeal plexus injury,[20] swelling of the tongue[21] to death due to retention.[13,22] Over a third of our respondents were aware of incidents related to throat pack use, an increase from that previously reported in 2008.[8] This increase may be a true increase in frequency, however, the current patient safety culture of openness, transparency and drive to share learning may result in overlap of reporting between respondents. The open comments section of the survey was enlightening, 11 incidents related to late removal of throat packs in recovery and eight comments highlighted a change in practice had been introduced to prevent recurrence. These included ensuring the throat pack is taken from the theatre swab count or the addition of throat pack checks as part of the WHO surgical safety checklist. One comment stated that their hospital had banned the use of throat packs.

Airway type and impact on use of throat packs

Laryngeal mask airways are suggested to be superior to ETTs in terms of safety, comfort and post-operative complications, with lower risk of dental or laryngeal trauma and reduced cardiorespiratory stimulation.[23,24] The literature documents widespread use of LMAs for dento-alveolar procedures.[25,26] However, a recent meta-analysis with particular relevance to oral surgeons found that LMAs have a higher incidence of partial upper airway obstruction than ETTs, especially when placing the mouth prop, moving the head and neck or undertaking oropharyngeal procedures.[27]

The need for a throat pack dependent on the airway type is controversial. Our survey found a third of oral surgeons opted for a throat pack based on the airway used. A small survey of anaesthetists also revealed inconsistency.[14] No difference in complications was found when omitting throat packs for paediatric cleft lip/palate surgery with a cuffed oral ETT in a recent study.[13] Further studies are needed examining LMAs and ETTs and the possible impact of throat packs on complications, so an evidence-based decision can be made.

Current throat pack use

So, what is the current picture of throat pack use by surgeons over a decade since the last national surveys? Our 2020

survey reveals a marked decrease in routine throat pack use by surgeons compared to the 2011 survey.[9] The numbers of surgeons who never use throat packs appears static.

Only a quarter of surgeons in our survey knew of the 2018 recommendations by DAS, BAOMS and ENT-UK.[10] This paper published in a UK-based anaesthetic journal with a high impact factor highlighted the lack of evidence to support anaesthetists routinely inserting throat packs.[10] Given the target audience, it is unsurprising that knowledge of these recommendations in the oral surgery community is poor. Our survey reveals a change in practice from the previous surveys, with a 20% decrease in anaesthetist-inserted throat packs and a concomitant rise in surgeons instead undertaking this role. Is this change in practice being driven by our anaesthetic colleagues?

The 2018 review paper states the person placing the pack assumes all the risk and legal responsibilities for its removal, and the NPSA concurs.[1,10] However, anaesthetists and surgeons have minimal agreement (between 4%–13%) with this statement.[8,9] Our survey found a clear decrease in the surgeons' view that anaesthetists' have responsibility and a concomitant increase that surgeons are responsible for final removal. This correlates with our findings that surgeons, rather than anaesthetists, are placing throat packs. Although the 2018 recommendations advocate individual responsibility, authors of previous national surveys endorse a "team-responsibility" approach in keeping with contemporary patient safety philosophy.[8,9] Only a third of anaesthetists and surgeons advocate shared responsibility in both ours and the 2008 survey.[8] This is disappointing given the promotion of a patient safety culture with a team approach due to potential human error. This confused picture of responsibility can only detract from safe patient management.

Safe throat pack use

From 2009, the NPSA highlighted the importance of justifying throat pack use.[1] We propose that the surgeon and anaesthetist openly discuss the use for each patient, as originally advised in 2008.[8] Team culture must empower collaboration. Our survey respondents appear cognisant of the importance of theatre culture with comments stressing the need to share decision-making. Collaborative, interprofessional teamwork with mutual respect significantly contributes to safety culture.[28] Throat packs are acknowledged as a latent threat to the airway and only their appropriate use can be justified, along with consistent safety strategies that minimise any retention risk.[8]

The 2008 survey highlighted poor adherence to safety processes, in particular a failure of the throat pack being included in the swab count.[8] Our survey noted a marked improvement with four-fifths of surgeons following best safety processes; radio-opaque material, a throat pack from the swab count, and a WHO 'sign out' check for removal. It is concerning that one-fifth are not.

CONCLUSION

Our survey noted continued variation in throat pack use by surgeons but a marked decrease in routine use, suggesting an increase in 'active' decision-making. We note a change in practice from previous surveys from anaesthetists to surgeons inserting throat packs. Surgeons had limited knowledge of the recent recommendation that anaesthetists should not routinely insert throat packs. So, this change in practice appears to be driven by our anaesthetic colleagues.

A dramatic improvement in surgical teams adhering to safety processes was seen compared to earlier surveys. Despite the contemporary view of the importance of teamwork and human factors to patient safety within healthcare, there has been no sea-change in adopting a team approach to throat pack use. This is disappointing and a potential risk for ensuring consistent safety processes.

It is now imperative to challenge the status-quo on throat pack use from a surgical perspective. The need for evidence for throat pack use during oral surgical procedures is critical.

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APPENDIX 1

Summary of Athanassoglou *et al* Recommendations[10]

The Athanassoglou *et al* paper published in 2018 carried out a systematic review to examine the evidence base for the benefits or harms of throat pack insertion by anaesthetists. The paper was a consensus statement endorsed by three national organisations: Difficult Airway Society (DAS), British Association of Oral and Maxillofacial Surgery (BAOMS) and the British Association of Otorhinolaryngology, Head and Neck Surgery (ENT-UK), and was published in a UK-based anaesthetic journal. A PubMed search that conformed to PRISMA guidelines found 45 relevant papers. Most of these related to complications following throat pack use or methods to prevent accidental retention, and no evidence for the use of anaesthetist-inserted throat packs was found. As a consequence, the authors (on behalf of their organisations) recommended that anaesthetists should not routinely insert throat packs for all upper airway or head and neck operations by anaesthetists. Instead, they advise a protocol where surgical need informs an active decision to place a throat pack, and in these circumstances, the throat pack is placed by the surgeon. If use of a laryngoscope is required to facilitate placement, then anaesthetic assistance should be requested. The throat pack should also be removed by the surgeon in order to allow completion of the final scrub count, and the anaesthetist then has responsibility for checking a clear airway prior to extubation. The critical step of using a throat pack from the scrub count is emphasised, as well as the suggestion that a check for throat pack removal is carried out as part of the 'sign out' in the surgical safety checklist.

APPENDIX 2

Q1. Do you use a throat pack for routine oral surgical procedures?
Always
Sometimes
Never
Don't know

Q2. Does the type of airway used influence your decision? (i.e. cuffed tube or LMA)
Yes
No

Q3. Who always, or nearly always, places the throat pack?
Anaesthetist
Surgeon
No preference

Don't know

Q4. Is your throat pack material radio-opaque?
Yes
No
Don't know

Q5. Is the throat pack included in the WHO checklist?
Yes
No
Don't know

Q6. Is the throat pack included in the scrub nurse's swab count?
Yes
No
Don't know

Q7. Who is responsible for the removal of the throat pack?
Anaesthetist
Surgeon
Whoever places the throat pack
Both anaesthetist and surgeon

Q8. Are you aware of any incidents of retained throat packs?
Yes
No

Q9. Are you aware of a recent consensus statement by DAS, BAOMS and ENT-UK published in 'Anaesthesia' in 2018?
Yes
No

Q10. Are there any comments you would like to make?